CLAIMS:

1. A signal observation system (SOS) for controlling a plurality of receiver channels simultaneously, the receiver channels comprised of tunable receivers and digitizers in a hardware configuration, wherein the tunable receivers and digitizers possess inherent properties that define their respective capabilities, the SOS comprising:

a processor readable storage medium;

code recorded in the processor readable storage medium to process a frequency schedule that defines an observation run, the frequency schedule being comprised of a set of lists, each list corresponding to a separate receiver channel, the lists comprised of a plurality of frequencies that define the frequencies each receiver channel is to observe during execution of the observation run and how long to observe each frequency before re-tuning to the next frequency in the list;

code recorded in the processor readable storage medium to generate a local synchronization signal that defines a triggering hierarchy that each receiver channel will reference during the observation run; and

code recorded in the processor readable storage medium to generate a start signal that is broadcast to the receiver channels that initiates an observation run that binds each receiver channel to the frequency schedule.

2. The signal observation system (SOS) of claim 1 further comprising:

code recorded in the processor readable storage medium to ensure that a user input time step parameter can be supported by the hardware configuration of the SOS based on a

computed minimum time step parameter derived from the inherent properties of the receiver channels.

3. The signal observation system (SOS) of claim 1 further comprising:

code recorded in the processor readable storage medium to ensure that the frequency schedule does not contain frequencies outside the frequency range supportable by the receiver channels as defined by the inherent properties of their respective tunable receivers.

4. The signal observation system (SOS) of claim 1 wherein the local synchronization signal is enslaved to a remote synchronization signal to permit a multiple site SOS implementation that ensures that each site is synchronized to the others and is executing its observation run based on a remote clock signal common to all sites.

5. The signal observation system (SOS) of claim 4 wherein the remote synchronization signal is obtained from a GPS signal.

6. A signal observation system (SOS) for controlling a plurality of receiver channels simultaneously, the SOS comprising:

a plurality of digitizers individually coupled with a plurality of tunable receivers forming a plurality of receiver channels such that each receiver channel can be tuned to a variety of frequencies so as to observe and digitize signals into digitized data;

storage means to receive and store digitized data observed by said receiver channels;

triggering means to control the tuning of the receivers and the timing of the digitizers;

and

a processor coupled via a digital backplane with the digitizers, receivers, storage means, and triggering means to control the actions of the digitizers, receivers, storage means, and triggering means based on a user supplied frequency schedule.

7. The signal observation system (SOS) of claim 6 wherein the frequency schedule defines an observation run, the frequency schedule being comprised of a set of lists, each list corresponding to a separate receiver channel, the lists comprised of a plurality of frequencies that define the frequencies each receiver channel is to observe during execution of the observation run and how long to observe each frequency before re-tuning to the next frequency in the list.

8. A method of controlling a plurality of receiver channels simultaneously, the receiver channels comprised of a tunable receivers and digitizers in a hardware configuration, wherein the tunable receivers and digitizers possess inherent properties that define their respective capabilities, the method comprising:

processing a frequency schedule that defines an observation run, the frequency schedule being comprised of a set of lists, each list corresponding to a separate receiver channel, the lists comprised of a plurality of frequencies that define the frequencies each receiver channel is to observe during execution of the observation run and how long to observe each frequency before re-tuning to the next frequency in the list;

generating a local synchronization signal that defines a triggering hierarchy that each receiver channel will follow during the observation run; and

generating a start signal that is broadcast to the receiver channels that initiates an observation run that binds each receiver channel to the frequency schedule.

9. The method of claim 8 further comprising:

ensuring that a user input time step parameter can be supported by the hardware configuration of the receiver channels based on a computed minimum time step parameter derived from the receiver and digitizer inherent properties.

10. The method of claim 8 further comprising:

ensuring that the frequency schedule does not contain frequencies outside the frequency range supportable by the receiver channels as defined by the inherent properties of their respective tunable receivers.

11. The method of claim 1 wherein the local synchronization signal is enslaved to a remote synchronization signal to permit a multiple site SOS implementation that ensures that each site is synchronized to the others and is executing its observation run based on a remote clock signal common to all sites.

12. The method of claim 11 wherein the remote synchronization signal is obtained from a GPS signal.